NEWS from
The Savannah River Site

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FOR IMMEDIATE RELEASE

SRNL Develops Device for Precise Cleaning Inside Tanks

AIKEN, S.C. (June 7, 2005) – Cleaning the inside of a storage tank or other type of vessel presents challenges, especially when access to the interior of the vessel is only possible through a small port a few inches in diameter. Those challenges are multiplied when the vessel has areas of contamination. Engineers at the U.S. Department of Energy's Savannah River National Laboratory (SRNL) have developed the Directed Spray Mast, a device that helps to overcome many of those challenges, precisely cleaning contaminated areas without generating unnecessary quantities of wastewater. The U.S. Patent and Trademark Office recently issued Patent No. 6,889,920 on the device.

Like many of SRNL's inventions, the Directed Spray Mast was initially conceived to solve a specific problem at the Savannah River Site, but has applications well beyond the site. SRS has numerous tanks and other types of vessels that contain radioactive materials. When these vessels need to be cleaned for reuse with other wastes or for final disposal of the vessel, a high-pressure spray of water is used to loosen and remove any contamination that has adhered to the inside.

"Spraying the inside of a tank with a high-pressure stream is a very effective way to remove contamination," says Tom Nance, one of the inventors, "but the water sprayed in the tank then becomes a waste product. Disposing of that waste safely and appropriately requires special handling, and considerable expense, so there is a real need to minimize the amount of liquid used for cleaning."

A typical sprayer is able to spray the entire inside of a vessel. When contamination is only present in specific areas, however, global spraying is not needed, and results in unnecessary quantities of waste liquid.

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The Directed Spray Mast features a unique “elbow” joint that allows it to aim its spray at the specific areas that require cleaning. The folding design also allows the device to gain access to the inside of the vessel through openings as small as 3 inches in diameter, cleaning a vessel up to 16 feet in diameter. It is also useful for cleaning larger tanks when there is access within 8 feet of the surface to be cleaned. SRNL has also developed a mobile platform that can be inserted into a tank, which could be used to move the spray mast around into position.

The Directed Spray Mast could also be used in other activities that require spraying the inside of a vessel, such as the application of coatings.

The device was initially conceived for use with one of SRS’s waste evaporators, which are used to reduce the volume of liquid radioactive waste. In its first deployment, it was used for cleaning the cell that holds the evaporator. It is now being considered for use in a large waste tank to test-clean coils suspended in the tank.

The Directed Spray Mast was invented by Tom Nance and Kevin Counts of SRNL, Al Siddall of SRS and William Cheng, formerly of SRNL.

Over the years, SRNL’s engineered equipment personnel have developed a wide range of remotely operated tools that allow work in areas where access is limited. These include a wide variety of tools to sample waste material, cut interfering objects, check a surface for radioactivity, visually inspect and photograph, retrieve objects, and clean. They have also devised a number of pipe crawlers that crawl through pipelines, allowing operators to see the inside of the pipes via cameras; many of these crawlers can also be equipped to perform work inside the pipes, such as retrieving objects that have become lodged in the pipe, cleaning the pipe, or even cutting it using a torch or saw.

SRNL is the applied research and development laboratory at the U.S. Department of Energy’s Savannah River Site and is operated by Westinghouse Savannah River Company for DOE. The laboratory puts science to work to provide practical technology solutions in the areas of energy security, national and homeland security, and environmental and process technology. WSRC is a wholly owned subsidiary of Washington Group International.

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Note: A photo is available from the media contact above.